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12 June 1969

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MEMORANDUM FOR: Chief, Technical Services & Support Group

SUBJECT : Development & Engineering Division Comments Concerning Final Report on Pre-Processed Cut Film Study, dated May 1969

1. The Development & Engineering Division has performed a rather thorough item-by-item analysis of the subject study. Generally speaking, the Chip Study is a very well written document and represents a great deal of time and effort on the part of several very conscientious people. However, it has, in our opinion, several serious overall weaknesses: A. The study makes several basic assumptions, and then, predicated upon these assumptions, builds an extremely logical and cohesive rationale and draws certain basic conclusions which are obvious if you follow the thought process. Unfortunately, there is an inherent weakness in this approach, that is, if the basic assumptions are wrong, then no matter how logical the rationale, the conclusions are of course erroneous. B. The study suffers from lack of objective data--there is little additional quantitative information provided in the report. C. There are a number of extrapolations of data which have been made in areas where it is dangerous to extrapolate. We feel that a large number of the computations made, and referred to in the study, would fall into this category. While the mathematics is undoubtedly correct, the rationale--as to whether the extrapolation can be made--is suspect. D. The report seems to be philosophically slanted towards acceptance of the status quo, that is, nothing will change, therefore, we need not change. This of course ignores advancing technology both in the areas of acquisition and exploitation systems and is not responsive to the fact that requirements do change.

These generalized statements are based upon the paragraph-by-paragraph review. Elements of major significance have been isolated and are included as follows:

I. Introduction

Page 2. Despite management's charge, one wonders why the committee restricted itself to a five-year period. For planning purposes and in terms of research and development of exploitation equipment, this is an extremely short time frame.

Page 2, Paragraph 1. If efficiences would result at all--from introduction of some cut film later in the period--they should result now as well as later.

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Page 2, Paragraph 2. Sifting and weighing subjective impressions is a valid way of obtaining data, if the number of samplings is broad enough to overcome the natural bias of small individual groups with highly specialized work functions. The sampling here is questionable.

Page 2, Paragraph 3. Both of these fundamental assumptions would appear suspect in the light of our experience. They appear too restrictive.

Paragraph 3a. The Center is a dynamic organization and has been in a constant state of flux for the last few years. The acquisition inputs will be changing, the exploitation equipment will change in response, and it appears reasonable that some of the requirements will change. Why, therefore, would we expect the Center to stay static; it appears to be an unrealistic premise.

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Page 3, Paragraph 3B (cont'd). There is considerable pressure from [redacted] to reduce the total number of roll film copies. Silver is becoming more scarce. Our building space is at a premium. The cost of reproduction is becoming more expensive. Why then assume that the number of work copies provide will not be decreased drastically. Furthermore, what's "adequate" depends upon requirements, resources, and deadlines. Today's adequate can be tomorrow's "too little too late."

Page 3, Paragraph 1. "Further study on the future mix of collection systems"--use of TSSG/PPB's 70-80 report would have been highly beneficial here.

II. Conclusions & Recommendations

A. Conclusions

1. Exploitation

Page 4, Paragraph 1(a). "Given the Center's present organization--" why restrict a study to organizational parameters? It would appear such a study should be addressed against functions, requirements and resources. What was the source of this data? Is it valid? The statement that "not all known targets can be reduced categorically to one size"--ignores the possibility of optical reduction printing and other technical approaches to the problem.

Paragraph 2(b). Chips are not always cut "just for future reference" or "after-the-fact." They are often cut to facilitate stereo manipulation or so that they will fit the stages of our better viewing equipments.

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Page 5, Paragraph 2(d). This analysis is at variance with the [redacted] Task Team Report. In light of our knowledge of the situation, to expect four or five DP's and one DM for the Center would appear an optimistic assumption at this point. What were the sources of information that led the committee to this conclusion? 25X1

2. Storage, Retrieval and Distribution

Page 5, Paragraph 3. The fact that we are taking steps to improve the utility of our existing film library space does not mean that we will have solved our problem. Where are the calculations upon which this projection was based? There seems to have been no allowance for the advent of the [redacted] 25X1

Page 5, Paragraph 4 (2b). If the Center were to adapt pre-processed chips as an exploitation vehicle, wouldn't the community look to NPIC for a central file of cut film? We are not necessarily alone in this venture.

Page 6, Paragraph 1 (2c). Concur. However, it is possible that requests for specific targets may be substantially increased if we had the imagery available in chip form, thereby making the situation worse.

Page 6, Paragraph 1 (2d). It would appear that automation could make a significant impact here, if the titling is re-formatted to an alpha-numeric system compatible with current hardware and software capabilities. More importantly, the data collected, with regard to film conflict, seems much too restrictive in nature to draw such a generalized conclusion. Information was not collected on KH-4 imagery even though the [redacted] was already known to produce no significant conflict since it is a pointing system and inherently not prone to conflicts. Without available KH-4 data we should use extreme caution in extrapolating with regards to the [redacted] 25X1 25X1

3. Production/Reproduction

Page 6, Paragraph 3 (3a). "The Center's roll film needs will be within the processing contractor's capability throughout the FY-1970-1975 frame." On what basis can we state this? The statement appears to conflict with a number of discussions we have heard on this topic.

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[redacted]

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Page 6, Paragraph 4 (3b). The Center's existing reproduction facilities are adequate--but only for a limited number of requests. The large number of requests resulting as an impact of the [redacted] may overpower that capability. 25X1

Page 6, Paragraph 4 (3c). "The quality of reproductions that the Center makes from the original negative now exceed the quality of duplicate positives of the mission film provided by the contractor." Is this true generally, or is this just an isolated example? This is a dangerous statement. Generally speaking, reproductions of short strips of film--or localized areas--can be made better than reproductions of roll film because the gamma, exposure, and processing can be related to the localized characteristics of the exposed film, in that specific area, instead of having to adjust to an average value for the total roll. If pre-processed chips were made at the processing site, these same adjustments would be made there. Furthermore, it must be emphasized that NPIC does not get the original negative until very late in the process. As a consequence, it is not normally available during phase I and phase II.

B. Recommendations

Page 7, Paragraph 1 (1a, b and). Has anyone calculated the space implications inherent in packing 130 ft. to a can? Does this 130 ft. include the leader?

Page 7, Paragraph 4 (2). What is the rationale for this conclusion? There is nothing implicit in (a1) or (a2) to support it. If we establish a valid need for chips at a later date, it may be too late. Remember the R&D cycle--approximately three years to build the necessary equipment.

3. Concur.

4. Concur. However--"that serve most of the interpreter's needs for oncoming and existing systems"--may, or may not, be true.

5. It would appear that we have no basis for this conclusion. Would not a fact-finding exercise be in order to determine the benefits to be gained from the Central File, then make a decision?

Pages 9, 10 and 11 (1) Exploitation. Pages 9, 10 and 11 contain a description of current chipping practices and are generally accurate. However, their statement regarding the use of the Automatic Stereo Scanner is somewhat outdated. We can't currently project its availability and they have not allowed for the fact that it will probably not be practical for wholesale readout. One option open to IEG in the mid-70's is to 25X1

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appoint some P.I.'s as target specialists and others as searchers only. The latter being a team effort. What would differentiate this procedure from current practice is that the searchers would conduct the "start to finish" roll search, excluding targets of interest to the specialists. While this section of the report is an accurate description of the current chipping practices, it does not follow that this is a good description of an efficient system [redacted] Once again, extrapolation is dangerous. 25X1

B. Mission Exploitation Effort

Page 12, Paragraph 1. While it is probably true that "efficiency must be geared to the organization in which the improved method will be used," it does not necessarily follow that efficiency must be geared to the current organizational structure or to the organizational procedures presently in use, since these can be so readily modified.

Pages 12-15. These pages cover the mission exploitation effort on a Division by Division basis breaking down the satellite coverage utilized in first and second phase exploitation, presenting it as a percentage of the whole. There is not much argument here if we accept the MIS Data as valid, though, the rationale of how some of the information and the conclusions included in the summary are derived from this data is not clear.

D. Third Phase Requirement for Pre-processed Chips or Cut Film

Page 16, Paragraph 2. It should be recalled that the original negative is not always available, since we receive it four to six weeks after receipt of mission at the processing site. Localized area reproductions are nearly always better than roll reproductions--whether produced in their photo lab, or ours. And the turn-around times projected while correct are based on small workloads and may, or may not, hold true for volume requirements [redacted] 25X1

E. First and Second Phase Requirements for Pre-Processed Chips or Cut Film

Page 16, Paragraph 5 through Page 19. This section covers analysis of first and second-phase reporting and analyzes the possibility of conflict over use of the same roll of film. This analysis is highly argumentative. The conclusions are certainly valid based upon their assumptions, but, based upon our own experience, we would have to challenge the assumptions. Time losts were calculated on the basis of first phase exploitation of a single mission [redacted] which they assumed to be typical. A single mission is not a broad enough sampling to be indicative of trends nor, in 25X1 25X1

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[redacted]

IV. Storage, Retrieval and Distribution

Page 20 A. Storage

Paragraph 1. Was the task team aware of the impact of the 4-bucket 25X1 [redacted]

Page 20, Paragraph 3. This is argumentative; however, they may be correct.

Page 21 B. Retrieval. This is one of the better portions of the study, and they have isolated two extremely important considerations which may be significant disadvantages of chips. These items are accountability and security.

Page 22, Paragraph 2. Distribution -- "was examined in detail on 25X1 missions [redacted]" "The efficiency of this operation is good and can be improved by procedural changes." Once again, this is true only of the current situation and does not mean that it will continue to be adequate for high volume systems such as [redacted] 25X1

Page 23

V. Production and Reproduction

Paragraph 1. "At present there is no indication that the requirements levied on the Center's photo lab will change." This is hard to believe 25X1 [redacted] Not only will NPIC's requirements probably increase, but we will probably have to allow for larger numbers of responses to external organizations' requests for reproduction.

Page 24, Paragraph 2. Is this statement really true? It is our understanding that such equipment is now under research and development by NRO. 25X1

[redacted]

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Paragraph 3, page 21. We are currently looking into the automation of this process.

VI. Estimated Benefits

A. General. The benefits, as explained and calculated in this section, give an estimate of the increase in efficiency that can be obtained from adapting pre-processed chips, and/or cut film in IEG.

Page 25, Paragraph 2. Cannot concur with the assumption.

Page 25, Paragraph 3. Again we cannot agree with the assumption. We do not believe that a photo interpreter "can mount and reel through a normal roll [redacted] photography in less than one minute," not under normal operating circumstances, where he is looking for an image to chip. Furthermore, if he is looking for stereo images the conjugate images would be located at two widely separate positions on the roll and at varying distances determined by the operational mode of the camera at that time. Stereo images [redacted] are a worse case and are located on entirely separate rolls of film. As a consequence, the data cannot be extrapolated between the two.

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Page 26, Paragraph 2. Why assume a 6"X 6" chip? It is an extremely unlikely format with regards to exploitation equipment and introduces major problems in viewing and measuring and in storage and retrieval. Furthermore, why do we have to assume that chips have to be cut? In the future, with the advent of the [redacted] reversal materials, it could be perfectly feasible--and more efficient--to do this photographically.

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Page 26, Paragraph 3, Sub-paragraph 1. Conjecture.

Subparagraph 2. Conjecture.

Subparagraph 3. [redacted] ever demonstrably reduced the chipping of KH-4?

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B. Summary of Benefits.

Page 27, Paragraph 1. Concur.

Page 27. [redacted]

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Page 29, Factors That Would Reduce This Gross Savings. Paragraph 1. Good dissertation, but why would we assume a re-cut requirement? Case not proven.

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Page 29. Paragraph 2 is a good point. It is an isolation of one of the major problems involved in chips; that is, security and accountability. Would concur with this paragraph if the system is not automated.

Page 29, Paragraph 3. This is possible, but it ignores the fact that the members of the breakdown team do other things besides.

Page 30, Statements 4 & 5. Pure conjecture.

Page 30.

Page 30. C. Conflict Savings

1. Assumptions. (a) According to IEG, [redacted] are about equal to those on the KH-4 system. Cannot concur. 25X1

Conflict Savings.

Paragraph B, Page 30. "Coverage per linear foot of the KH-4 is about 600 square miles [redacted]" It is somewhat doubtful that these figures are correct and can be utilized in the computations to the extent that they are. The area covered is dependent upon the focal length, the orbit, and the mode of operation of the camera. Since the scale varies across the format in a panaramic camera, and in extremely complex manner on a convergent pancramic system, it is difficult to be that exact regarding area coverage. Furthermore, the mode of [redacted] It would be interesting to review how they obtain their data. 25X1 25X1

Page 31, C. How can we possibly assume that the targets are uniformly distributed on the KH-4? A look at the greater Moscow area and then a look at the Gobi Desert should solve the argument once and for all. The statement that, [redacted] 25X1

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Page 34. What was the basis for assuming average time to resolve conflicts, as 17 minutes per conflict and 20 minutes per conflict, respectively? Upon what data were these projections based? 25X1

[redacted]

In summation:

1. The Chip study has isolated some weaknesses of a chip approach. These lie mainly in the area of accountability and security. They have raised the logical question of whether we should attempt to deprive the photo interpreters of their individual files. These are sound questions and need to be resolved through objective studies, which are statistically valid, thereby attempting as much as possible to get away from subjective considerations. Along this line, this study would have been stronger if they had utilized some of the statistically valid data obtained through 25X1 [redacted] experimental work.

2. The study quotes certain assumptions. Their handling of these assumptions is good. Based upon these assumptions, they have drawn certain reasonable conclusions. However, our analysis of the same problems would indicate that we cannot agree with the basic premises. In particular,

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3. It would seem that the Chip Study would have appeared more valid if they had presented the advantages along with the disadvantages of a chip system and then allowed management to make the judgment. The study loses something through its obvious one-sideness.

4. It has been our experience that both roll film and chips are valid methods of handling photographic imagery. Each has its advantages and its disadvantages. Each is better for certain types of application--just like IBM punch cards and magnetic tape. It is the Development and Engineering Division's position that we must advance the technology necessary to utilize both forms efficiently and that the ultimate choice for operational implementation will then follow naturally, based upon the advantages and the disadvantages inherent with a particular type of format, predicated upon the particular application. Such a technological base can only result from intensive study and analysis of the best existing systems and the current state-of-the-art in film reproduction, film handling, film titling, and film processing. Rational decisions can only be based upon factual data. We have few facts at this point. Our chip implementation study should provide the data we need.

[redacted] 25X1

Deputy Chief,
Development & Engineering Division, TSSG

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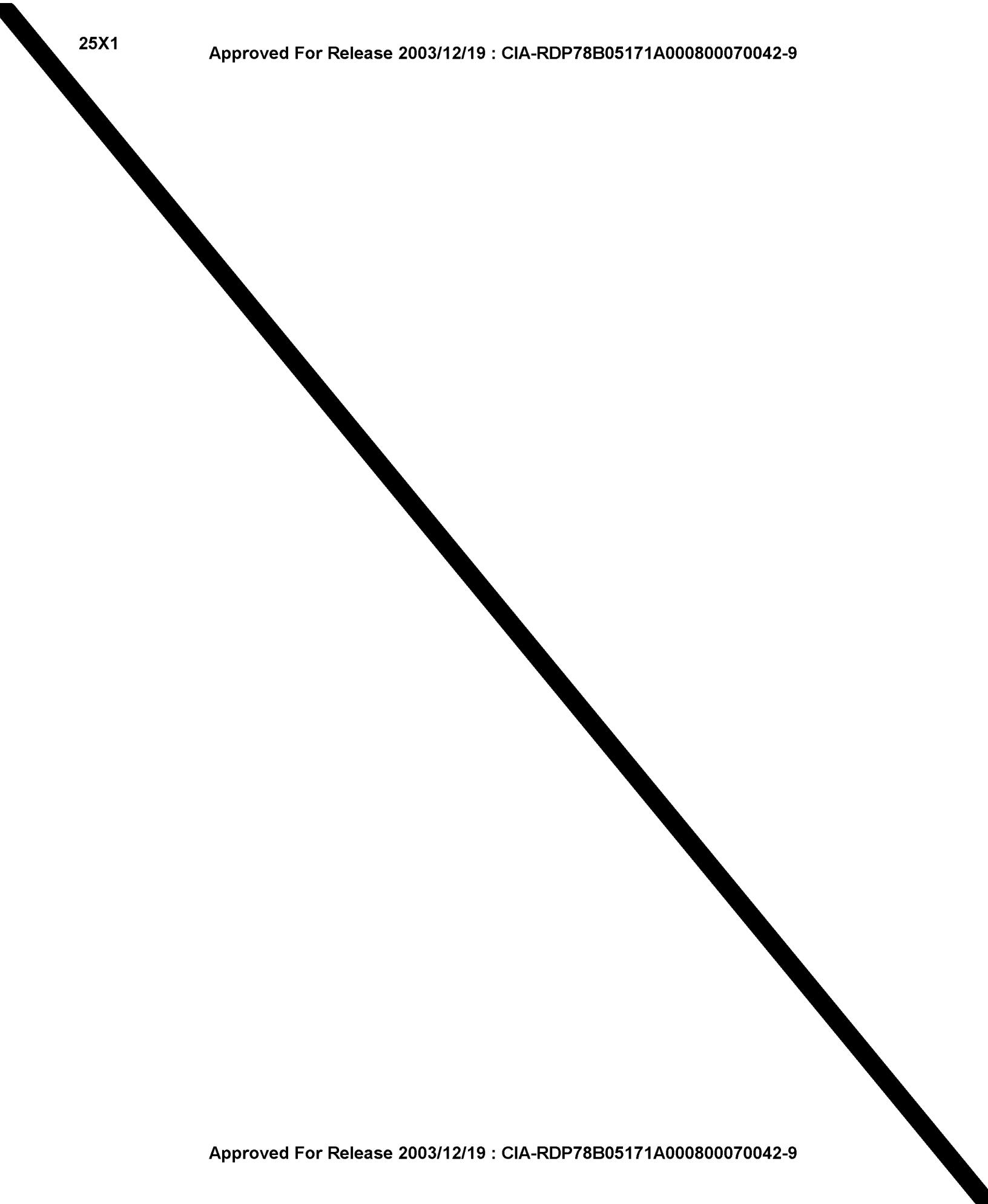

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